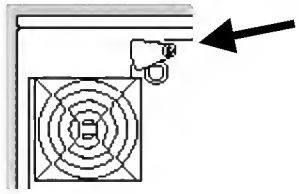
Evita 4 / Evita 2 dura
Electrical Safety Test in the USA and Canada according to CAN/CSA - 22.2 No. 601.1 - M90

1 Visual inspection of basic unit

- Power cord
- Attachment of power cord with screw terminal.
- Mains switch with protective cover (picture shows off position).



- Compare power pack fuses to stated ratings.
- CO2 sensor: housing and connecting cable not damaged.

2 Safety Testing with Biotek Model 501

- **Warning**: These tests can expose personnel to hazardous electric shock and must be carried out with caution.
- Disconnect external batteries (if available on units with DC option)
- Note: Do not plug the Biotek 501 Pro safety analyzer power cord into a line isolation monitor as inaccurate readings may occur.
- Plug the Biotek 501 Pro power cord into a live AC receptacle, place the power switch of the Biotek 501 Pro to the "1" or ON position and ensure that the keys marked "GROUND", "NEUTRAL" and "POLARITY" are in the NORMAL position.
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.

2.1 Chassis Resistance Testing

- Attach the ground lead from the red "Test lead" input to the ground hole of the AC test receptacle on the Biotek 501 Pro. Select the "Single lead" condition by ensuring that the "SINGLE/DUAL" key is not illuminated. Press the gray key marked "RESIST", then press the blue key marked "CAL". When the word CAL is no longer shown in the display window of the Biotek 501 Pro, you may proceed.

- Remove the red lead from the ground hole of the AC test receptacle and attach the alligator clip to the free end, leaving the other end plugged into the red "Test lead" input of the Biotek 501 Pro with the "Single Lead" and "Resistance" conditions still selected.

- Plug the Evita 4 / 2 dura power cord into the test receptacle of the Biotek 501 Pro. The resistance reading then shown on the Biotek 501 Pro is the "Chassis Resistance". Bend and exercise the power cord to check for intermittent reading when probe is attached to the potential ground stud (test item 5).

- Perform 4 tests with the probe attached to the following test items of the Evita 4 / 2 dura:

  1) Pneumatics gas connection, back side of Evita 4 / 2 dura

  2) Screws of PCBs electronic system, back side of Evita 4 / 2 dura

  3) Screws on front panel

  4) Rails, on side of Evita 4 / 2 dura

  5) Attach probe with an alligator clip to the potential ground stud of the power pack on the back side of Evita 4 / 2 dura.

- Maximum allowable test value:

Chassis Resistance	0.2 Ohm

- Afterwards leave alligator clip at the potential ground stud.

2.2 Enclosure Leakage Current (Chassis Leakage Testing)

- Press the gray "LEAKAGE" key, leaving all other selections from the previous test the same.
- Switch on Evita 4 / 2 dura and allow the unit to complete the self test.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.
- This is a measurement of the leakage current from the Chassis to earth ground.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 µA
Normal Ground, Reverse Polarity, Normal Neutral:	100 µA

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 µA, but not 0 µA
Open Ground, Reverse Polarity, Normal Neutral:	500 µA, but not 0 µA

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

2.3 Earth Leakage Current (Ground Wire Leakage Testing)

- Remove the red lead with the alligator clip from potential ground stud of the power pack of the Evita 4 / 2 dura.
- Remove the alligator clip from the red test lead and plug this end into the green input jack "GROUND" on the back panel on the Biotek 501 Pro.
- Leave all other selections from the previous test the same.
- The Evita 4 / 2 dura is still switched on.

- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".

- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lit, they are in the normal position.

- This is a measurement of the leakage current flowing through the ground wire of the power cord.

- Maximum allowable test values under Normal Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 µA, but not 0 µA
Open Ground, Reverse Polarity, Normal Neutral:	500 µA, but not 0 µA

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- **Important for units with DC option for the next measurement:**
  Run unit without mains connection or with "Open Neutral" until internal batteries are flat and acoustic mains failure alarm sounds. The screen must be blank for the next measurement on units with DC option!

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Open Neutral:	1000 µA
Open Ground, Reverse Polarity, Open Neutral:	1000 µA

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Do **not** switch off Evita 4 / 2 dura for test item 2.4.

2.4 Patient leakage current entire electronics to earth

- Remove the test lead from the Biotek 501 Pro and leave all other selections from the previous test the same.

- Use one of the 2 possibilities for the test set-up:

  1. For all units:

     - Short the two pins of the temperature connection by using "Shorting plug, AWT sensor" P/N 79 10 364.
       Also possible is to short the ILV connection (but not pin 2, 5 and 7 !!!!) by using the previous version of this test cable "Measuring line, 9-pin Evita 4 / 2 dura" with the P/N 79 10 393.

     - Plug the other end into the input jack "RA" of the Biotek 501 Pro.

  2. For units with installed NeoFlow option only:

     - Connect a flow sensor cable on the back side of the Evita 4 / 2 dura.

     - Short all pins of the flow sensor cable using the shorting plug 79 01 772.

     - Plug the other end into the input jack "RA" of the Biotek 501 Pro.

- Select the "ECG LEAK" key on the Biotek 501 Pro.

- Use the Increment or Decrement arrow on the Biotek 501 Pro to select the "RA-Gnd" option.

- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".

- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 µA
Normal Ground, Reverse Polarity, Normal Neutral:	100 µA

  (According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 µA
Open Ground, Reverse Polarity, Normal Neutral:	500 µA

  (According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Only if **no** SpO2 option is available: Switch off Evita 4 / 2 dura and remove the test equipment.

2.5 Patient leakage current SpO2 connection to earth (only if option is fitted)

- Remove the test lead from the Biotek 501 Pro and leave all other selections from the previous test the same.
- Connect shorted SpO2 connector to the input jack "RA" of the Biotek 501 Pro by using the test cable from the "Nellcor test simulator set" 79 01 069.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 µA
Normal Ground, Reverse Polarity, Normal Neutral:	100 µA

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 µA
Open Ground, Reverse Polarity, Normal Neutral:	500 µA

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Switch off Evita 4 / 2 dura and remove the test equipment.